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Scientific Opinion on the substantiation of a health claim related to zinc and normal
function of the immune system pursuant to Article 14 of Regulation (EC) No 1924/2006**

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SCIENTIFIC OPINION

Scientific Opinion on the substantiation of a health claim related to zinc and normal function of the immune system pursuant to Article 14 of Regulation (EC) No 1924/2006¹

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)^{2,3}

European Food Safety Authority (EFSA), Parma, Italy

ABSTRACT

Following an application from Specialised Nutrition Europe (formerly IDACE), submitted pursuant to Article 14 of Regulation (EC) No 1924/2006 via the Competent Authority of France, the EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA) was asked to deliver an opinion on the scientific substantiation of a health claim related to zinc and normal function of the immune system. The food constituent, zinc, which is the subject of the health claim is sufficiently characterised. Normal function of the immune system is a beneficial physiological effect for infants and young children. A claim on zinc and function of the immune system in the general population has already been assessed with a favourable outcome. The Panel considers that the role of zinc in normal function of the immune system applies to all ages, including infants and young children (from birth to three years). The Panel concludes that a cause and effect relationship has been established between the dietary intake of zinc and normal function of the immune system. The following wording reflects the scientific evidence: “zinc contributes to normal function of the immune system”.

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KEY WORDS

zinc, infants, children, immune system, health claims

¹ On request from the Competent Authority of France following an application by Specialised Nutrition Europe (formerly IDACE), Question No EFSA-Q-2008-189, adopted on 10 April 2014.

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SUMMARY

Following an application from Specialised Nutrition Europe (formerly IDACE), submitted for authorisation of a health claim pursuant to Article 14 of Regulation (EC) No 1924/2006 via the Competent Authority of France, the EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA) was asked to deliver an opinion on the scientific substantiation of a health claim related to zinc and normal function of the immune system.

The scope of the application was proposed to fall under a health claim referring to children's development and health.

The food constituent that is the subject of the health claim is zinc, which is an essential nutrient and is measurable in foods by established methods. The Panel considers that zinc is sufficiently characterised.

The claimed effect proposed by the applicant is "zinc helps to support a healthy immune system". The target population proposed by the applicant is infants and young children from birth to three years of age. The Panel considers that normal function of the immune system is a beneficial physiological effect for infants and young children.

A claim on zinc and normal function of the immune system in the general population has already been assessed with a favourable outcome. The conclusion of the Panel was based on the essentiality of zinc with respect to the function of the immune system.

The Panel considers that the role of zinc in normal function of immune system applies to all ages, including infants and young children (from birth to three years).

The Panel concludes that a cause and effect relationship has been established between the dietary intake of zinc and normal function of the immune system.

The following wording reflects the scientific evidence: "zinc contributes to normal function of the immune system".

The Panel considers that, in order to bear the claim, follow-on formulae should comply with the criteria of composition of follow-on formulae as laid down in Directive 2006/141/EC; nutritionally complete foods for special medical purposes intended for use by infants and nutritionally complete foods for special medical purposes other than those intended for use by infants should comply with the criteria of composition of these foods as laid down in Directive 1999/21/EC; processed cereal-based foods and baby foods for infants and young children should comply with the criteria of composition of these foods as laid down in Directive 2006/125/EC; other foodstuffs intended for infants and young children should provide at least 15 % of the reference values for nutrition labelling for foods intended for infants and young children as laid down in Directive 2006/141/EC. Such amounts can be easily consumed as part of a balanced diet. The target population is infants and children up to three years. A Tolerable Upper Intake Level has been established for zinc in this age group.

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BACKGROUND

Regulation (EC) No 1924/2006⁴ harmonises the provisions that relate to nutrition and health claims, and establishes rules governing the Community authorisation of health claims made on foods. As a rule, health claims are prohibited unless they comply with the general and specific requirements of this Regulation, are authorised in accordance with this Regulation, and are included in the lists of authorised claims provided for in Articles 13 and 14 thereof. In particular, Articles 14 to 17 of this Regulation lay down provisions for the authorisation and subsequent inclusion of reduction of disease risk claims and claims referring to children's development and health in a Community list of permitted claims.

According to Article 15 of this Regulation, an application for authorisation shall be submitted by the applicant to the national competent authority of a Member State, which will make the application and any supplementary information supplied by the applicant available to the European Food Safety Authority (EFSA).

STEPS TAKEN BY EFSA

- The application was received on 14/02/2008.
- The scope of the application was proposed to fall under a health claim referring to children's development and health.
- On 26/03/2008, during the validation process of the application, EFSA sent a request to the applicant to provide missing information.
- On 09/12/2013, EFSA received the missing information as submitted by the applicant.
- The scientific evaluation procedure started on 21/01/2014.
- During its meeting on 10/04/2014, the NDA Panel, having evaluated the data submitted, adopted an opinion on the scientific substantiation of a health claim related to zinc and normal function of the immune system.

TERMS OF REFERENCE

EFSA is requested to evaluate the scientific data submitted by the applicant in accordance with Article 16 of Regulation (EC) No 1924/2006. On the basis of that evaluation, EFSA will issue an opinion on the scientific substantiation of a health claim related to zinc and normal function of the immune system.

EFSA DISCLAIMER

The present opinion does not constitute, and cannot be construed as, an authorisation for the marketing of zinc, a positive assessment of its safety, *nor a decision on whether zinc is, or is not, classified as a foodstuff*. It should be noted that such an assessment is not foreseen in the framework of Regulation (EC) No 1924/2006.

It should also be highlighted that the scope, the proposed wording of the claim, and the conditions of use as proposed by the applicant may be subject to changes, pending the outcome of the authorisation procedure foreseen in Article 17 of Regulation (EC) No 1924/2006.

⁴ Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods. OJ L 404, 30.12.2006, p. 9–25.

INFORMATION PROVIDED BY THE APPLICANT

Applicant's name and address: Specialised Nutrition Europe (formerly IDACE), 9–31 Avenue des Nerviens, 1040 Brussels, Belgium.

Food/constituent as stated by the applicant

According to the applicant, the food constituent for which the claim is made is zinc.

Health relationship as claimed by the applicant

According to the applicant, zinc supplementation showed, for instance, a positive impact on the lymphocyte proliferation and the lipopolysaccharide-specific immunoglobulin G response in infants (Raqib et al., 2004) or on shigellacidal antibody response and on the proportions of CD20+ and CD20+CD38+ cells (Rahman et al., 2005). Several very recent trials and meta-analysis of studies done on infants and young children (Aggarwal et al., 2007; Garenne et al., 2007; Lazzerini et al., 2008; Lukacik et al., 2008) have confirmed that the impact of zinc supplementation on infants and young children is positive - reduction of the duration and severity of acute and persistent diarrhoea, thereby preventing and providing aid in the treatment of diarrhoea - even if there are some inconsistencies among studies owing to heterogeneity in zinc dosages, endpoints and study design. Zinc supplementation in infants and young children (especially > 6 months) is positive and helps prevent and treat respiratory infections (Brooks et al., 2004; Mahalanabis et al., 2004; Aggarwal et al., 2007).

Wording of the health claim as proposed by the applicant

The applicant has proposed the following wording for the health claim: “zinc helps to support a healthy immune system”.

Equivalent wordings: “zinc is necessary for a healthy immune system”, “zinc is important for the normal development of immune function”, “zinc plays an important role for the function of natural defences”, “zinc helps to support the normal function of immune system”, “zinc participates in the normal function of immune system”, “zinc is needed for the normal function of immune system”, “zinc supports the normal function of immune system”.

Specific conditions of use as proposed by the applicant

According to the applicant, the target population is infants and young children from birth to three years of age.

According to the applicant, the quantity needed to achieve the claimed effect is:

- For follow-on formulae, the content in zinc should be within the range set in Directive 2006/141/EC.
- For dietary foods for special medical purposes, the content in zinc should be within the range set in Directive 1999/21/EC.
- For processed cereal-based foods and baby foods, the content in zinc should be within the range set in Directive 2006/125/EC.
- For processed cereal-based foods and baby foods, the content in zinc should reach at least 15 % of the Nutrient Reference Values set in Directive 2006/125/EC, i.e. 15 % of 4 mg per 100 g or 100 mL or per serving, as reconstituted.
- For foods intended for infants and young children other than follow-on formulae, processed cereal-based foods and baby foods, the content in zinc should reach at least 15 % of the Nutrient Reference Values set in Directive 2006/141/EC, i.e. 15 % of 5 mg per 100 mL product ready for use.

ASSESSMENT

1. Characterisation of the constituent

The food constituent that is the subject of the health claim is zinc, which is an essential nutrient and is measurable in foods by established methods. Different forms of zinc occur naturally in foods and are authorised for addition to foods and for use in food supplements (Annex II of Regulation (EC) No 1925/2006,⁵ Annex II of Directive 2002/46/EC,⁶ Annex III of Directive 2006/141/EC,⁷ Annex IV of Directive 2006/125/EC,⁸ Directive 2001/15/EC⁹). This evaluation applies to zinc naturally present in foods and those forms authorised for addition to foods (Annex II of Regulation (EC) No 1925/2006, Annex II of Directive 2002/46/EC, Annex III of Directive 2006/141/EC, Annex IV of Directive 2006/125/EC, Directive 2001/15/EC).

The Panel considers that the food constituent, zinc, which is the subject of the health claim, is sufficiently characterised.

2. Relevance of the claimed effect to human health

The claimed effect proposed by the applicant is “zinc helps to support a healthy immune system”. The target population proposed by the applicant is infants and young children from birth to three years of age.

The Panel considers that the normal function of the immune system is a beneficial physiological effect for infants and young children.

3. Scientific substantiation of the claimed effect

The applicant performed a literature search in PubMed and Cochrane database, using the search terms: “zinc”, “child-preschool in age OR infant in age OR infant newborn in age”, “clinical trial OR review OR meta-analysis”, “zinc deficiency OR zinc OR zinc compounds” and a time frame between 2003 and 2008. Studies on zinc combined with other micronutrients, in children older than three years old and on outcomes other than the immune system (i.e. growth, anaemia, cognitive and motor development, zinc status) were excluded.

The applicant identified 14 human studies, including nine human intervention studies (Brooks et al., 2004; Mahalanabis et al., 2004; Rahman et al., 2005; Raqib et al., 2006; Bose et al., 2006; Coles et al., 2007; Garenne et al., 2007; Tielsch et al., 2007; Walker et al., 2007) and five meta-analyses or protocols for meta-analyses of human intervention studies (Abba and Garner, 2007; Aggarwal et al., 2007; Haider et al., 2008; Lazzerini and Ronfani, 2008; Lukacik et al., 2008) as relevant to the claim.

The Panel has already assessed a claim on zinc and normal function of the immune system with a favourable outcome (EFSA NDA Panel, 2009). The target population was the general population. The conclusion of the Panel was based on the essentiality of zinc with respect to the function of the immune system. Zinc deficiency is associated with a decline in most aspects of immune function and renders people more susceptible to infections.

The Panel considers that the role of zinc in normal function of the immune system applies to all ages, including infants and young children (from birth to three years).

⁵ Regulation (EC) No 1925/2006 of the European Parliament and of the Council of 20 December 2006 on the addition of vitamins and minerals and of certain other substances to foods. OJ L 404, 30.12.2006, p. 26–38.

⁶ Directive 2002/46/EC of the European Parliament and of the Council of 10 June 2002 on the approximation of the laws of the Member States relating to food supplements. OJ L 183, 12.7.2002, p. 51–57.

⁷ Commission Directive 2006/141/EC of 22 December 2006 on infant formulae and follow-on formulae and amending Directive 1999/21/EC Text with EEA relevance. OJ L 401, 30.12.2006, p. 1–33.

⁸ Commission Directive 2006/125/EC of 5 December 2006 on processed cereal-based foods and baby foods for infants and young children. OJ L 339, 6.12.2006, p. 16–35.

⁹ Commission Directive 2001/15/EC of 15 February 2001 on substances that may be added for specific nutritional purposes in foods for particular nutritional uses. OJ L 52, 22.2.2001, p. 19–25.

The Panel concludes that a cause and effect relationship has been established between the dietary intake of zinc and normal function of the immune system.

4. Panel's comments on the proposed wording

The Panel considers that the following wording reflects the scientific evidence: “zinc contributes to normal function of the immune system”.

5. Conditions and restrictions of use

The Panel considers that in order to bear the claim:

- follow-on formulae should comply with the criteria of composition of follow-on formulae as laid down in Directive 2006/141/EC;
- nutritionally complete foods for special medical purposes intended for use by infants and nutritionally complete foods for special medical purposes other than those intended for use by infants should comply with the criteria of composition of these foods as laid down in Directive 1999/21/EC¹⁰;
- processed cereal-based foods for infants and young children should comply with the criteria of composition of these foods as laid down in Directive 2006/125/EC;
- other foodstuffs intended for infants and young children should provide at least 15 % of the reference values for nutrition labelling for foods intended for infants and young children as laid down in Directive 2006/141/EC.

Such amounts can be easily consumed as part of a balanced diet. The target population is infants and children up to three years. A Tolerable Upper Intake Level (UL) has been established for zinc in this age group, and has been set at 7 mg/day (SCF, 2002).

CONCLUSIONS

On the basis of the data presented, the Panel concludes that:

- The food constituent, zinc, which is the subject of the health claim is sufficiently characterised.
- The claimed effect proposed by the applicant is “zinc helps to support a healthy immune system”. The target population proposed by the applicant is infants and young children from birth to three years of age. Normal function of the immune system is a beneficial physiological effect for infants and young children.
- A cause and effect relationship has been established between the dietary intake of zinc and normal function of the immune system.
- The following wording reflects the scientific evidence: “zinc contributes to normal function of the immune system”.
- In order to bear the claim, follow-on formulae should comply with the criteria of composition of follow-on formulae as laid down in Directive 2006/141/EC; nutritionally complete foods for special medical purposes intended for use by infants and nutritionally complete foods for special medical purposes other than those intended for use by infants should comply with the criteria of composition of these foods as laid down in Directive 1999/21/EC; processed cereal-

¹⁰ Commission Directive 1999/21/EC of 25 March 1999 on dietary foods for special medical purposes. OJ L 91, 7.4.1999, p. 29–36.

based foods and baby foods for infants and young children should comply with the criteria of composition of these foods as laid down in Directive 2006/125/EC; other foodstuffs intended for infants and young children should provide at least 15 % of the reference values for nutrition labelling for foods intended for infants and young children as laid down in Directive 2006/141/EC. Such amounts can be easily consumed as part of a balanced diet. The target population is infants and children up to three years. A Tolerable Upper Intake Level (UL) has been established for zinc in this age group, and has been set at 7 mg/day (SCF, 2002).

DOCUMENTATION PROVIDED TO EFSA

Health claim application on zinc and function of the immune system pursuant to Article 14 of Regulation (EC) No 1924/2006 (Claim serial No: 0109_FR). February 2008. Submitted by Specialised Nutrition Europe (formerly IDACE).

REFERENCES

- Abba K and Garner P, 2007. Zinc supplements for preventing otitis media (Protocol). Cochrane Database of Systematic Reviews, 3, CD006639.
- Aggarwal R; Sentz J and Miller MA, 2007. Role of zinc administration in prevention of childhood diarrhoea and respiratory illnesses: a meta-analysis. *Pediatrics*, 119, 1120–1130.
- Bose A, Coles CL, Gunavathi JH, Moses P, Raghupathy P, Kirubakaran C, Black RE, Brooks WA and Santosham M, 2006. Efficacy of zinc in the treatment of severe pneumonia in hospitalized children <2 y old. *American Journal of Clinical Nutrition*, 83, 1089–1096.
- Brooks WA, Yunus M, Santosham M, Wahed MA, Nahar K, Yeasmin S and Black RE, 2004. Zinc for severe pneumonia in very young children: double-blind placebo-controlled trial. *Lancet*, 363, 1683–1688.
- Coles CL, Bose A, Moses PD, Mathew L, Agarwal I, Mammen T and Santosham M, 2007. Infectious etiology modifies the treatment effect of zinc in severe pneumonia. *American Journal of Clinical Nutrition*, 86, 397–403.
- EFSA NDA Panel (EFSA Panel on Dietetic Products, Nutrition and Allergies), 2009. Scientific Opinion on the substantiation of health claims related to zinc and function of the immune system (ID 291, 1757), DNA synthesis and cell division (ID 292, 1759), protection of DNA, proteins and lipids from oxidative damage (ID 294, 1758), maintenance of bone (ID 295, 1756), cognitive function (ID 296), fertility and reproduction (ID 297, 300), reproductive development (ID 298), muscle function (ID 299), metabolism of fatty acids (ID 302), maintenance of joints (ID 305), function of the heart and blood vessels (ID 306), prostate function (ID 307), thyroid function (ID 308), acid-base metabolism (ID 360), vitamin A metabolism (ID 361) and maintenance of vision (ID 361) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. *EFSA Journal* 2009;7(9):1229, 34 pp. doi:10.2903/j.efsa.2009.1229
- Garenne M, Becher H, Ye Y, Kouyate B and Muller O, 2007. Sex-specific responses to zinc supplementation in Nouna, Burkina Faso. *Journal of Pediatric Gastroenterology and Nutrition*, 44, 619–628.
- Haider BA, Humayun Q and Bhutta ZA, 2008. Zinc supplementation as an adjunct to antibiotics in the treatment of pneumonia in children 2 to 59 months of age (Protocol). Cochrane Database of Systematic Reviews, 4, CD007368.
- Lazzerini M and Ronfani L, 2008. Oral zinc for treating diarrhoea in children. Cochrane Database Systematic Reviews, 3, CD005436.
- Lukacik M, Thomas RL and Aranda JV, 2008. A meta-analysis of the effects of oral zinc in the treatment of acute and persistent diarrhoea. *Pediatrics*, 121, 326–336.
- Mahalanabis D, Lahiri M, Paul D, Gupta S, Gupta A, Wahed MA and Khaled MA, 2004. Randomized, double-blind, placebo-controlled clinical trial of the efficacy of treatment with zinc or

- vitamin A in infants and young children with severe acute lower respiratory infection. *American Journal of Clinical Nutrition*, 79, 430–436.
- Rahman MJ, Sarker P, Roy SK, Ahmad SM, Chisti J, Azim T, Mathan M, Sack D, Andersson J and Raqib R, 2005. Effect of zinc supplementation as adjunct therapy on the systemic immune response in shigellosis. *American Journal of Clinical Nutrition*, 81, 495–502.
- Raqib R, Roy SK, Rahman MJ, Azim T, Ameer SS, Chisti J and Andersson J, 2004. Effect of zinc supplementation on immune and inflammatory responses in pediatric patients with shigellosis. *American Journal of Clinical Nutrition*, 79, 444–450.
- SCF, 2002. Opinion of the Scientific Committee on Food on the Tolerable Upper Level of zinc (expressed on 5 March 2003). SCF/CS/NUT?UPPLEV/62 Final, 18 pp.
- Tielsch JM, Khattri SK, Stoltzfus RJ, Katz J, Leclercq SC, Adhikari R, Mullany LC, Black R and Shrestha S, 2007. Effect of daily zinc supplementation on child mortality in southern Nepal: a community-based, cluster randomised, placebo-controlled trial. *Lancet*, 370, 1230–1239.
- Walker CL, Bhutta ZA, Bhandari N, Teka T, Shahid F, Taneja S and Black RE, 2007. Zinc during and in convalescence from diarrhoea has no demonstrable effect on subsequent morbidity and anthropometric status among infants <6 mo of age. *American Journal of Clinical Nutrition*, 85, 887–894.